REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
13 February 2006	FINAL	

4. TITLE AND SUBTITLE

Decision-Centric Warfare: Reading Between the Lines of Network-Centric Warfare

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

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5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Joint Military Operations Department
Naval War College
686 Cushing Road
Newport, RI 02841-1207

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Distribution Statement A: Approved for public release; Distribution is unlimited.

13. SUPPLEMENTARY NOTES A paper submitted to the faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.

14. ABSTRACT

Network-Centric Warfare (NCW), as it has come to be called, is here to stay. While the benefits are proving to be many, there are also potential risks that can adversely affect operational leadership. Increasingly, commanders today must be aware of how the effects of information overload, instantaneous communications, and increased opportunities to insert themselves in levels of war outside their traditional sphere of influence can have a bearing on their decision-making. NCW's very name has a tendency to focus attention strictly on the technology, as if once "the system" is implemented or "the device" installed, that everything will work out for the best. The technology is merely an enabler, another addition to commanders' toolkits to help them make better decisions. To avoid the "if you build it they will come" mentality, the focus must be maintained on decision-making and the decisions that result through a commander's application of operational art. This paper proposes replacing one word and calling it Decision-Centric Warfare to maintain the proper focus. Not only does the name change align more directly with Joint Vision 2020's concept of decision superiority, but when one looks at the NCW terminology and construct, decisions are really what NCW is all about.

15. SUBJECT TERMS

Decision-Centric Warfare, Network-Centric Warfare, Decision Superiority, Information Superiority

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Chairman, JMO Dept
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED		25	19b. TELEPHONE NUMBER *(include area code)* 401-841-3556

Standard Form 298 (Rev. 8-98)

NAVAL WAR COLLEGE
Newport, RI

DECISION-CENTRIC WARFARE: READING BETWEEN THE LINES OF NETWORK-CENTRIC WARFARE

by

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A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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ABSTRACT

Network-Centric Warfare (NCW), as it has come to be called, is here to stay. While the benefits are proving to be many, there are also potential risks that can adversely affect operational leadership. Increasingly, commanders today must be aware of how the effects of information overload, instantaneous communications, and increased opportunities to insert themselves in levels of war outside their traditional sphere of influence can have a bearing on their decision-making. NCW's very name has a tendency to focus attention strictly on the technology, as if once "the system" is implemented or "the device" installed, that everything will work out for the best. The technology is merely an enabler, another addition to commanders' toolkits to help them make better decisions. To avoid the "if you build it they will come" mentality, the focus must be maintained on decision-making and the decisions that result through a commander's application of operational art. This paper proposes replacing one word and calling it *Decision*-Centric Warfare to maintain the proper focus. Not only does the name change align more directly with Joint Vision 2020's concept of decision superiority, but when one looks at the NCW terminology and construct, decisions are really what NCW is all about.

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INTRODUCTION

Our lives are filled with decisions: what to wear, what to eat, who to talk to, if we will watch television when we get home and, if so, what we will watch. Most, if not all, of the decisions we make in the course of any given day border on the trivial. Consequently, we spend very little time, if any at all, making them. The more important a decision is, however, such as what house to buy, who to marry, or where to work, the more time and resources generally go into making the decision.

War is also filled with decisions. Unlike the time we have in our personal lives to makes choices, however, time is a luxury rarely afforded in war. Moreover, many of the decisions are far from mundane, impacting the life or death of individuals, the stability of regions, or the resolve of nations. As one moves up the levels of war, from the tactical to the strategic, the more far-reaching and profound the decisions typically become. It has been said that "all military operations are based on decisions"[1] and that "decision-making is the essence of command in battle."[2] Logic would dictate, then, that if decision making is so important, a great deal of time and effort would go into improving the decision-making process. The history of warfare bears this out as militaries have incessantly adapted new technologies, while studying the lessons from previous conflicts and training accordingly, to disrupt the enemy's decision-making process while enhancing their own.

At no other time in history has technology had a greater impact on decision-making at all levels of war than in today's Information Age. The accessibility and availability of massive amounts of information in today's networked environment is astounding. Admiral Nimitz would have never had to ask the question, "Where is, repeat where is, Task Force 34? The world wonders"[3] during the Battle of Leyte Gulf if he could have had access to a

Common Operating Picture like those that exist in today's operations centers. He would have seen in near real-time Admiral Halsey's Third Fleet heading north after Ozawa's carriers and could have made the decision then and there either to have Halsey detach Task Force 34 and pursue Ozawa with his carriers only, or not to pursue at all. While one could undoubtedly identify countless "what if" scenarios of the past where the quantity or quality of decisions would have been drastically improved given real-time information, the point is that today's interconnected and information-rich environment has permanently affected decision-making in warfare.

Network-Centric Warfare (NCW), as it has come to be called, is here to stay. While the benefits are proving to be many, there are also potential risks that can adversely affect operational leadership. Commanders today increasingly must be aware of how the effects of information overload, instantaneous communication, and increased opportunities to insert themselves in levels of war outside their given sphere can influence their decision-making. NCW's very name has a tendency to focus attention strictly on the technology, as if once "the system" is implemented or "the device" installed, that everything will work out for the best. As some have warned, "NCW is a process, a means to achieve a particular end. In practice it's likely to become the end itself, operating in a network centric environment will be pushed as the ultimate objective, without any clear idea what this means."[4] As another has pointed out, "technology alone is an insufficient precondition for effective network-centric operations."[5] To avoid the "if you build it they will come" mentality, the focus must be maintained on decision-making and the decisions that result by commanders applying operational art. This paper proposes replacing one word and calling it *Decision*-Centric Warfare to maintain the proper focus. After all, decisions are really what NCW is all about.

NETWORK-CENTRIC WARFARE BACKGROUND

The origin of the NCW concept can be traced to a *United States Naval Institute Proceedings* article co-written by Vice Admiral Arthur Cebrowski (generally considered the father of the concept)[6] and John Gartska, where they articulate:

> We are in the midst of a revolution in military affairs (RMA) unlike any seen since the Napoleonic Age, when France transformed warfare with the concept of *levee en masse*. Chief of Naval Operations Admiral Jay Johnson has called it "a fundamental shift from what we call platform-centric warfare to something called network-centric warfare," and it will prove to be the most important RMA in the past 200 years.[7]

Thereafter, a series of books sponsored by the office of the Assistant Secretary of Defense for Networks and Information Integration fleshed out the intellectual foundations of the concept. The first of these, *Network Centric Warfare: Developing and Leveraging Information Superiority* by Alberts, Gartska and Stein, offered the following definition of NCW: "an information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization."[8] Along with this definition, four basic tenets of NCW have been identified: "1) a robustly networked force improves information sharing, 2) information sharing enhances the quality of information and shared situational awareness, 3) shared situational awareness enables collaboration and self-synchronization, and enhances sustainability and speed of command, and 4) these, in turn, dramatically increase mission effectiveness."[9] While there are also a number of governing principles that have been developed under the NCW construct to provide further guidance for conducting operations in the Information Age, the Department of Defense's Office of Force Transformation highlighted in its paper, *The Implementation of Network-Centric Warfare*, that the essence of

NCW is translating "information advantage into combat power by effectively linking friendly forces with the battlespace, providing a much improved shared awareness of the situation, enabling more rapid and effective decision making at all levels of military operations, and thereby allowing for increased speed of execution."[10]

READING BETWEEN THE LINES

The definition and tenets of NCW, while supporting the premise, never fully drive home the point that the paramount concern is really about enhancing the commander's ability to make decisions. Whether it helps the commander make quicker decisions, more decisions in a given amount of time, or decisions that would have never been possible before, when one reads between the lines of the NCW terminology, it is all about decisions. Moreover, it is all about *quality* decisions. Terms such as "shared situational awareness," "increased speed of command," and "information sharing" are only important inasmuch as they enhance decision-making. As Dr. Milan Vego states, "information is valuable insofar as it contributes to the commander's knowledge and understanding."[11]

Alberts, Gartska and Stein recognize this when they state, "we see the power of NCW being derived from empowering all the decision makers in the battlespace"[12] and acknowledge that the "Information Age has changed the way we reach decisions, allocate decision responsibilities within the organization, develop options and evaluate them, and the manner in which we choose among them."[13] The bottom line is that all the information being shared should be either input to, or the output of, a decision. The Alberts book laments the baggage that accompanies the term NCW due to the fact that some have focused strictly on the communications technology aspect. As one critic states, "the Department of Defense is spending billions of dollars constructing complex interwoven technologies, all the while

making the assumption that collaboration will just happen once the infrastructure is built."[14] Alberts denies such allegations, asserting that "NCW does not focus on network-centric computing and communications, but rather focuses on information flows, the nature and characteristics of battlespace entities, and how they need to interact."[15] What should be implied from this statement is that the purpose of focusing on information flows and interactions among entities is to generate superior decision-making that should ultimately result in a dramatic increase in mission effectiveness – the final tenet of NCW.

To help put an end to the accusations that NCW focuses predominantly, if not exclusively, on the networking and communications technology, this paper proposes to call it what it probably should have been called all along: Decision-Centric Warfare. By taking the word "network" out of the description, the focal point of the discussion is shifted to its true center, that of improving decision-making. Even Alberts, Gartska and Stein were not inextricably tied to the term NCW when they stated that "NCW is the best term developed to date to describe the way we will organize and fight in the information age."[16] Others have been dissatisfied with the term NCW as well and have offered up their own terminology, such as "Transformational Warfare."[17] Here again, however, the focus is not where it should be.

The definition of NCW identifies three entities that are networked in the battlespace: sensors, decision makers and shooters. It gives no priority to any of the three, when clearly the decision maker is the most important entity since it is the node that directs the actions and interactions of the other two. To be sure, sensors and shooters (which more and more can be one and the same in a networked environment) serve at the will of the decision maker, either contributing to or executing his decisions. Furthermore, the network itself serves (at least it

should) at the will of the decision maker and is simply another tool to enhance the decision maker's ability to direct actions that will most efficiently and effectively achieve desired objectives. A simple search on Google illustrates this point. When one types in "Network-Centric Warfare" on the Google search engine, there is no mention of decisions or decision-making in the descriptions of the results that appear. However, when one searches on "Decision-Centric Warfare," all of the results include references to Network-Centric Warfare.[18]

DECISION DILEMMAS

While the term Decision-Centric Warfare attempts to provide clarity and focus to the discussions about operating in today's networked environment, it does not change the fact that commanders will continue to have to make decisions in fast-paced surroundings full of uncertainty. As Michael Handel has noted, "many of the latest military theories and doctrines assume tacitly or explicitly that the wars of the future will be waged with perfect or nearly perfect information and intelligence…. This vision is a chimera, because it implies that friction in war will be greatly reduced if not eliminated."[19] Instead, as the Office of Force Transformation has recognized, "the issue is how one creates and exploits an information advantage within the context of the fog and friction of war."[20] In other words, commanders will still have to practice the "highest art of operational leadership," as Dr. Vego has described it, which is "to make timely and sound decisions."[21]

Today's fast-paced, interconnected and information-crowded atmosphere presents new challenges, or old challenges in a new light, which operational commanders must contend with in their decision-making. These decision dilemmas of the Information Age only compound an already formidable task for the operational commander. For one, while

more information might generally be considered better, the sheer volume of information available to the commander can be critically distracting. Additionally, the age-old issue of how much control to centralize or distribute surfaces in new ways. Finally, while "the faster the better" seems to be today's mantra, the frenetic pace of today's battlespace can potentially induce a commander to make a premature decision based on an artificial perception that he has no remaining time in which to make it.

CULMINATING POINT OF INFORMATION

Around the time of the first atomic bomb, society began to produce more information than it could process. One weekday edition of today's *New York Times* contains more information than the average person in 17th-century England was likely to come across in an entire lifetime[22] and it is estimated that "the volume and speed of information has been increasing as much as 100% each year."[23] As David Shenk admonishes, "in our roaring technological prosperity, we have, so far, ignored the lesson…that every technology has service effects and disservice effects – positive and negative consequences for society."[24] Potential negatives that today's commanders must contend with in the Information Age are delayed decisions that result from incessantly searching for more and more information, and "analysis paralysis," where the sheer quantity of information, often times contradicting itself, makes it difficult to know when or what to decide.

While NCW's concept of situational awareness should lead to speedier decision making, Aldo Borgu warns that "in practice, the more information a commander has at his disposal the more time he could take to make a decision – not least due to always wanting more information before deciding."[25] Akin to the psychology of putting "just one more" quarter in a slot machine in the hope that the jackpot is just one lever-pull away, commanders

may be tempted to delay, hoping that just a little more information will provide what they need to make a more effective decision. While it is certainly the commander's prerogative to weigh factor time against the other operational factors, there is no guarantee that the additional information will contribute in any significant degree to an improved decision. In fact, it may only increase confusion about the state of events. As Dr. Vego has stated, "one can know more, but this makes one more, not less, uncertain."[26]

Similarly, as commanders continue to assimilate more and more information, there is a danger of experiencing "analysis paralysis," where there is so much information that it becomes difficult to know when a decision needs to be made. As Shenk points out, "when it comes to information, it turns out that one can have too much of a good thing. At a certain level of input, the law of diminishing returns takes effect; the glut of information no longer adds…but instead begins to cultivate stress, confusion, and even ignorance."[27] This "data smog,"[28] created by the metastasizing number of sensors in the battlespace as well as deception operations by the adversary, aggravates an already stressful situation where the commander is often getting minimal sleep.

To borrow from Clausewitz's concept of the culminating point,[29] there is a culminating point of information that a commander must recognize. Going beyond this point provides little added value to any decision since reality dictates there will always be uncertainty in the battlespace. As Voltaire once noted, "doubt is not a pleasant state but certainty is a ridiculous one."[30] An essential trait in a commander is "the moral courage to make decisions in the face of uncertainty."[31] Operational art is the construct that assists the commander in knowing when that culminating point is reached. As the commander considers forces and functions while applying his own leadership qualities to the planning

and execution of operations, the information coming from today's increasingly networked capabilities is there simply as an enabler. It is not the driver. As Dr. Vego has noted, "information should properly be considered as an aid to, not the master of, the operational commanders and their staffs."[32]

Until recently, Joint Publications defined information superiority as "the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same."[33] While this definition means well, it seems to imply, in the same vein as the popular bumper sticker "the person with the most toys wins," that the force with the most information wins. As Hank Kamradt proposes, the information battle is really "for and against information *sufficiency* not superiority."[34] In this context, the culminating point of information is reached when the commander has sufficient information to make an informed decision. Anything more than what is sufficient might be construed as wasted time and effort, similar to a 100 yard dash competitor racing 110 yards. The new joint definition accommodates this notion, defining information superiority as "that degree of dominance in the information domain which permits the conduct of operations without effective opposition."[35]

DECIDING HOW MUCH TO TRUST

Much has been written about how today's networked forces have enabled operational commanders to reach down and control tactical actions. Current operations centers are replete with Unmanned Aerial Vehicle (UAV) sensor feeds from the battlefield, near real-time positional information via common operating pictures, and the capability to talk directly to aircraft cockpits, soldiers on the ground, or ships at sea. The debate continues to rage about the appropriateness of operational leaders getting involved at the tactical level.

General Wesley Clark deemed that "every day's activities had strategic impact"[36] and General Tommy Franks felt he had "died and gone to heaven and seen the first bit of net-centric warfare at work"[37] during Operation *Iraqi Freedom*. Others, however, saw the networking capabilities as a "metastasized command and control meshwork" that allowed senior leaders to intervene "at the tactical level not because circumstances required it, but simply because they could."[38] The concept of "reachback," allowing forward-edge forces to obtain additional information from higher echelons in support of their mission, mutated into the concept of "reach-forward"[39] where senior commanders would reach out to control lower-level activities.

The tug-of-war between centralized and decentralized decision-making is not new. The targeting decisions made by President Johnson in the White House during the Vietnam War are well known. One of the major reasons for Chiang Kai-shek's defeat in the Chinese Civil War was his unwillingness to delegate authority and his attempts to control operations through written orders that were usually out of date when delivered.[40] No doubt this has been an issue since man began waging war. Today's networks should not be the center of the debate, yet the term "Network-Centric" once again puts the focus on the technology instead of where it should be – on the decisions that were made by commanders on how to use the technology. As Nicole Blatt has stated, "there is a constant struggle in leadership styles between tight control and…trust and influence" and that "operational trust is the lynchpin in all networked operations."[41] Just as in wars past, commanders operating in today's battlespace must *decide* (decision-centric) on the level of trust they place in their forces. Traditionally, that trust has been conveyed through such vehicles as the commander's intent

and the rules of engagement. The network has now become another avenue for the commander to convey trust.

The fact that commanders can actually reinforce and refine their intent near real-time by making corrections to an operation as it unfolds is a new phenomenon in war. The key is that it must be done for good reasons through a conscientious decision, not simply because one can. Just as it takes discipline not to eat M&Ms from the bowl on a coffee table (we do not eat them because we need them, but simply because they are there), commanders must exercise discipline in getting involved at the tactical level. After all, the more "tactical M&Ms" an operational commander consumes, the more they may be pushed "into becoming control freaks, fed by an almost unlimited data flow."[42] That does not mean there are never any good reasons to intervene at the tactical level. As Air Force Doctrine Document 1 concedes, "in some situations there may be valid reasons for execution of specific operations at higher levels, most notably when the JFC (or perhaps even higher authorities) may wish to control strategic effects, even at the sacrifice of tactical efficiency."[43] Returning to the example at the Battle of Leyte Gulf, Admiral Halsey was operating under Nimitz's intent that included two distinct missions. First, he was to "cover and support forces of the Southwest Pacific." Second, "in case opportunity for destruction of major portion of the enemy fleet offer or can be created, such destruction becomes the primary task."[44] Admiral Halsey obviously used the second task as the basis for pursuing Ozawa's carriers. Yet Admiral Nimitz's intent was really to make the destruction of the enemy fleet the primary task only if the forces of the Southwest Pacific were sufficiently covered and supported. Otherwise, he never would have asked the question as to Halsey's whereabouts. If Nimitz had possessed

today's decision-centric capabilities in his era, there is no doubt he would have clarified his intent by ordering Halsey to stay and cover the landing forces.

It is not a matter of having to choose between the two extremes of centralization or decentralization. Instead, it is for the commander to decide where on the spectrum between the two they will operate. While today's decision-centric environment may make that decision more complex, it also adds a great deal of flexibility. As General Ron Keys, USAF, responded when asked if the priority should be getting information to the operations center or to the fighters, "I think of it as information communism – each platform gives based on its capabilities and receives based on its needs."[45]

SPEED OF DECISION

The cliché of engaging the enemy at the "time and place of our own choosing" takes on new meaning in the Information Age. Increasingly, the time is as soon as we identify him and the place is where we identify him. The speed with which today's technologies allow us to find, fix, track, target, engage and assess targets, commonly referred to as the "kill chain,"[46] continues to accelerate. Additionally, new capabilities such as modern UAVs have created new decision opportunities that simply did not exist before. These, combined with the increasing speed of command, allow commanders to make more decisions in a given amount of time than ever before. While this "decision mass" is generally beneficial, it can reach a point of critical mass if the commander does not remain vigilant.

Thomas Barnett, in describing the fifth sin of his "Seven Deadly Sins of NCW," observes that the "unspoken assumption concerning speed of command seems to be that because we receive and process data faster, we have to act on it faster."[47] Alberts, Gartska and Stein also recognized this, stating "it is ironic that the Information Age, which on one

hand gives us vastly increased capabilities to collect and process data that make it possible to make better and better decisions more and more quickly, is – with the other hand – reducing the time available to make decisions."[48] The push is on to approach the theoretical position where the longest step in the decision cycle is the commander's own cognitive abilities to understand all of the presented information and make a decision. We have all played games like Scrabble where the longer we take to decide what word to play, the more the pressure from other players builds. We sometimes find ourselves playing a word that does not yield as many points as we think we could have earned if only more time had been allowed to consider additional letter combinations.

While Scrabble is a far cry from warfare (though some games have, no doubt, turned belligerent), the example depicts the inherent interaction between the culminating point of information and speed of decision. While a player may have a word to put down, it may not deliver the necessary number of points to either stay in the lead or remain a contender. In other words, a point of culmination, or sufficiency, has not been reached in the player's estimation. However, the more time that goes on, and the more impatient the other players become, the player at some point alters his perception of sufficiency and plays the inferior word. The key is that such a decision is not made in a vacuum. The player also takes into account, among other things, how far it is into the game (time), his own chances of a higher-scoring word the next round based on the number of remaining tiles (space), and the abilities and positions of the other players (force). While these considerations might be considered the "operational art of Scrabble," they underscore the fact that there is much more that goes into a decision based on a player's experience. It is no different for a commander applying operational art in today's networked battlespace.

CONCLUSION

Some are beginning to argue that the concept of NCW is "no longer transformational, but an accepted and enduring part of current and future combat,"[49] highlighting how in Afghanistan and Iraq "American forces were able to integrate information and communication systems and procedures to accomplish more with less, and faster, than would have been possible even a decade ago."[50] There is no question current technologies are having a positive impact on our fielded forces. We can never lose sight, however, of the fact that the technology is an enabler and not an end unto itself. As John Luddy states, "key aspects of leadership and the art of war, such as intelligence, training and command initiative, can be assisted by a network, but they cannot be replaced by one."[51]

Still, there are those who assert that "the human dimension in warfare is more likely to be ignored at the expense of the network"[52] and even go so far as to say that "human participation in warfare is likely to be rare" or that humans may even be out of the "military decision business" altogether.[53] These statements suggest that the term Network-Centric Warfare is misunderstood. The focus of such comments is on the network and its associated technologies when, as Dr. Vego notes, "the human element will dominate the conduct of war as long as war is the clash of human wills."[54] Indeed, as this paper has addressed, the true focus of NCW is really on helping human beings make decisions. The fact that much of the literature on NCW references John Boyd's Observe-Orient-Decide-Act (OODA) Loop (this paper now included) strongly supports this. The OODA Loop is, after all, called a *decision* cycle. The dominant step in the cycle is to *decide* since it cannot repeat itself until a decision has been made, and all other steps exist either to facilitate the decision or evaluate its repercussions. As the Department of Defense's most steadfast advocate of NCW, the Office

of Force Transformation recognizes that "NCW has a profound impact on the planning and conduct of war by allowing forces to increase the pace and quality of decision making."[55]

Borrowing from BASF's popular television commercials, NCW doesn't make the decisions, it makes the decisions better. Steven R. Covey said "the main thing is to keep the main thing the main thing."[56] In the case of NCW, the "main thing" is really about improved decision-making. The name, however, distorts this fact. Changing the name to Decision-Centric Warfare adds clarity and dispels opponents' accusations that it is strictly about the network and associated technologies. Directly couching the concept in decision-making prevents us from seeking to network-enable a platform or other asset simply because we can. Instead, Decision-Centric Warfare focuses on the issue of how the networking of an asset enhances our decision-making (and subsequent execution). Networking everything just because we can may create the proverbial "self-licking ice cream cone" of networked entities that provide no meaningful improvement to our decision-making capabilities. Keeping the focus on how decision-making might be improved helps prevent this.

Finally, Decision-Centric Warfare aligns more harmoniously with Joint Vision (JV) 2020's concept of "decision superiority." As JV 2020 articulates, "information superiority provides the joint force a competitive advantage only when it is effectively translated into superior knowledge and decisions…to achieve decision superiority – better decisions arrived at and implemented faster than an opponent can react."[57] JV 2020 expands on this thought, stating that "decision superiority results from superior information filtered through the commander's experience, knowledge, training, and judgment."[58] The "experience, knowledge, training, and judgment" spoken of is obtained through the study and application of operational art over time. There are those who contend that "network-centric warfare will

require a new type of combat leader, one who can master technology and information, then make rapid and correct decisions."[59] Such is not the case. While leaders should have an understanding of the information-rich world in which we now live, they will have the necessary professionals working for them who will deliver the relevant, timely and accurate information. Even in a world of increased speed and availability of information, the commander will still be required to apply the time-tested tenets of operational art to make the decisions that will lead to a successful outcome in the battlespace.

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